CLAIMS

Sub a' 1. A disk apparatus comprising:

a disk medium capable of recording/playing back data,

a buffer memory for temporarily storing audiovisual data,

buffer memory control means for controlling the input/output of said audiovisual data for said buffer memory,

audiovisual frame detection means for detecting audiovisual frame boundaries from said audiovisual data and outputting a detection signal,

data division management means for dividing said audiovisual data depending on said detection signal and forming the management information of said divided data, and

writing means for writing said audiovisual data on said disk medium in accordance with said management information.

2. A disk apparatus in accordance with claim 1, further comprising data addition means for generating record data packets by adding predetermined data to said audiovisual data in accordance with said management information,

wherein said writing means writes said record data packets on said disk medium.

3. A disk apparatus in accordance with claim 2, wherein said data addition means comprises input data counter means for measuring the amount of audiovisual data input externally, and additional data generating means for generating additional data in accordance with said measured amount of audiovisual data.

4. A disk apparatus in accordance with claim 2, wherein said data addition means comprises output data counter means for measuring the amount of audiovisual data output from said buffer memory, and additional data generation means for generating additional data in accordance with said measured amount of audiovisual data.

5. A disk apparatus comprising:

a disk medium capable of recording/playing back data,

a buffer memory for temporarily storing audiovisual data,

playback data selection means for selecting said audiovisual data to be output externally from among said audiovisual data recorded on said disk medium,

reading means for reading said audiovisual data selected by said playback data selection means from said disk medium,

buffer memory control means for storing said audiovisual data read from said disk medium into said buffer memory, and

stream data generation means for generating stream data by combining the data stored in said buffer memory and for externally outputting said stream data continuously.

6. A disk apparatus in accordance with claim 5, wherein said stream data generation means generates stream data by combining said audiovisual data in said buffer memory in audiovisual frame units at plural times, and externally outputs

said stream data continuously.

7. A disk apparatus in accordance with claim 5, wherein said playback data selection means selects said audiovisual data to be output externally from among said audiovisual data recorded in said buffer memory, notifies the storage address in said buffer memory corresponding to said selected audiovisual data to said buffer memory control means, and

said buffer memory control means selects said audiovisual data for external output in said buffer memory on the basis of said storage address, outputs said selected audiovisual data.

8. A disk apparatus in accordance with claim 5,

wherein said playback data selection means sequentially selects said audiovisual data to be output externally in audiovisual frame units from among said audiovisual data recorded on said disk medium, sorts said plural pieces of selected audiovisual frame data in accordance with the placement sequence on said disk medium corresponding thereto, and notifies to said reading means,

said reading means reads said audiovisual frame data notified by said playback data selection means in said placement sequence on said disk medium, and transfers to said buffer memory control means,

said buffer memory control means stores said audiovisual frame data transferred from said reading means into said buffer memory in the sequence for external output, and

said stream data generation means sequentially combines said audiovisual frame data in said buffer memory in the sequence for external output, and outputs externally.

9. A disk apparatus in accordance with claim 5, wherein said playback data selection means thins out and selects said audiovisual data recorded on said disk medium in audiovisual frame units.

10. A disk apparatus in accordance with claim 5, wherein said playback data selection means selects said audiovisual data thinned out from said audiovisual data recorded on said disk medium in audiovisual frame units as data to be output externally, and

said stream data generation means generates stream data by combining said audiovisual data in said buffer memory in audiovisual frame units at plural times.

11. A disk apparatus comprising:

a disk medium capable of recording/playing back data,

record/playback means for recording/playing back data on said disk medium,

a buffer memory for temporarily storing said audiovisual data,

buffer memory control means for controlling the input/output of said audiovisual data to said buffer memory,

playback data selection means for selecting data to be output externally,

reading means for reading said audiovisual data

selected by said playback data selection means from said disk apparatus via said external disk interface means,

data extraction means for extracting said audiovisual data to be output externally from among said audiovisual data read from said disk medium, and

stream data generation means for combining and externally outputting said audiovisual data extracted by said data extraction means.

12. A disk apparatus comprising:

a disk medium capable of recording/playing back data,

record/playback means for recording/playing back data on said disk medium,

a buffer memory for temporarily storing audiovisual data, disposed between said record/playback means and an interface to an external apparatus,

buffer memory control means for controlling the input/output of said audiovisual data for said buffer memory, and

audiovisual frame detection means for detecting audiovisual frame boundaries from said audiovisual data and for outputting a detection signal.

13. A disk apparatus in accordance with claim 12, further comprising:

transmitted/received data amount calculation means for calculating the amount of data input/output to said buffer memory control means on the basis of the amount of audiovisual

frame boundaries detected by said audiovisual frame detection means.

14. A disk apparatus in accordance with claim 12, further comprising:

a frame address management means for storing address values in said buffer memory corresponding to said audiovisual data at said audiovisual frame boundaries.

15. A disk apparatus in accordance with claim 12, further comprising frame address management means for storing address values in said buffer memory corresponding to said audiovisual data at said audiovisual boundaries, and access address control means for controlling the access addresses of said buffer memory control means in accordance with the addresses of said frame address management means.

16. A disk apparatus in accordance with claim 12, further comprising:

data output timing control means for controlling the output timing of said audiovisual data in synchronization with the timing of detecting audiovisual frames by said audiovisual frame detection means.

17. A disk apparatus comprising:

a disk medium capable of recording/playing back data,

record/playback means for recording/playing back data on said disk medium, and

recording area management means for managing and updating the recording area information of recorded audiovisual

data,

wherein said record/playback means carries out data record/playback in the sequence of the addresses on said disk medium, and

said recording area management means manages and updates the record start address information of the head audiovisual frame data of said recorded audiovisual data, the record start address information of the end audiovisual frame data of said recorded audiovisual data and the head address information of the unrecorded area on said disk medium, and carries out writing in predetermined areas on said disk medium.

18. A disk apparatus in accordance with claim 17, wherein said recording area management means updates the record start address information of the end audiovisual frame data of said recorded audiovisual data and the head address information of the unrecorded area on said disk medium, when the record stop or record standby processing of said audiovisual data is carried out.

19. A disk apparatus in accordance with claim 17, wherein said recording area management means sets the record start address of the head audiovisual frame data of said recorded audiovisual data at the record start address of the end audiovisual frame data of said recorded audiovisual data and the head address of the unrecorded area on said disk medium in response to a request for erasing said recorded audiovisual data from an external apparatus.

20. A disk apparatus in accordance with claim 17,
wherein said recording area management means
temporarily stores the record start address of the end
audiovisual frame data of said recorded audiovisual data and the
head address of the unrecorded area on said disk medium as the
record start address of the pre-erasure end audiovisual frame
data and the head address of the pre-erasure unrecorded area,
respectively, in response to a request for erasing said recorded
audiovisual data from an external apparatus, and

the record start address of the end audiovisual frame
data of said recorded audiovisual data is compared with the
record start address of said pre-erasure end audiovisual frame
data in response to the request for erasing said recorded
audiovisual data from an external apparatus, in the case that
the record start address of the end audiovisual frame data of
said recorded audiovisual data is farther than the record start
address of said pre-erasure end audiovisual frame data from the
end of the recording area, the record start address of the end
audiovisual frame data of said recorded audiovisual data and the
head address of the unrecorded area on said disk medium are
aligned with the record start address of said pre-erasure end
audiovisual frame data and the head address of said pre-erasure
unrecorded area on said disk medium.

21. A disk apparatus in accordance with claim 17,
further comprising an address management means for managing the
head address of the audiovisual frame data being recorded or

played back or the head address of the audiovisual frame data to be recorded or played back next on said disk medium.

22. A disk apparatus in accordance with claim 21, wherein said address management means selects the address, on said disk medium, of the end or head audiovisual frame data of said recorded audiovisual data managed by said recording area management means as the head address of the audiovisual frame data to be recorded/played back next in response to a fast forward or rewind request from an external apparatus.

23. A disk apparatus in accordance with claim 21, further comprising playback control means for carrying out playback control for said audiovisual data on the basis of said recording area information or said head address information.

24. A disk apparatus in accordance with claim 21, further comprising record management means for carrying out record control for said audiovisual data on the basis of the information managed by said recording area management means or said address management means.

25. A disk apparatus in accordance with claim 21, further comprising search means for searching for audiovisual data recorded on said disk medium on the basis of an absolute track number or time code in response to a search request from an external apparatus.

26. A disk apparatus in accordance with claim 17, further comprising:

information detection means for detecting

predetermined information from among recorded audiovisual data,
and

in the case that predetermined information is
detected by said information detection means, mark information
management means for managing and updating at least the record
start address information corresponding to the audiovisual frame
data from which said predetermined information is detected and
the time code information or the absolute track number
information included in said audiovisual frame data.

27. A disk apparatus in accordance with claim 26,
further comprising mark information notification means for
notifying a series of mark information managed by said disk
apparatus to an external apparatus.

28. A disk apparatus in accordance with claim 17,
further comprising:

mark command receiving means for receiving a mark
addition request from an external apparatus, and

mark information management means, in response to a
mark addition request from said external apparatus, for managing
and updating at least the record start address information
corresponding to the audiovisual frame data being recorded or
played back at the time of the generation of said mark addition
request and the time code information or the absolute track
number information included in said audiovisual frame data.

29. A disk apparatus in accordance with claim 28,
further comprising mark information notification means for

notifying a series of mark information managed by said disk apparatus to said external apparatus.

30. A disk apparatus in accordance with claim 17, further comprising:

mark information receiving means for receiving mark information notified from an external apparatus, and

mark information management means for detecting the audiovisual frame data corresponding to the time code information or absolute track number information included in said mark information notified from said external apparatus at the time of recording audiovisual data, and for managing and updating the record start address information on said disk medium corresponding to said detected audiovisual frame data and the time code information or the absolute track number information included in said detected audiovisual frame data.

31. A disk apparatus in accordance with claim 30, further comprising mark information notification means for notifying a series of mark information managed by said disk apparatus to an external apparatus.

32. An audiovisual data processing apparatus comprising:

external disk interface means for controlling record/playback of audiovisual data for a disk apparatus,

external audiovisual apparatus interface means for controlling record/playback of said audiovisual data for an audiovisual apparatus,

a buffer memory for temporarily storing said audiovisual data, disposed between said external disk interface means and said audiovisual apparatus interface means,

buffer memory control means for controlling the input/output of said audiovisual data for said buffer memory,

audiovisual frame detection means for detecting audiovisual frame boundaries from said audiovisual data and for outputting a detection signal, and

data division management means for dividing said audiovisual data in accordance with said audiovisual frame boundaries and for forming the management information of said divided data,

wherein said external disk interface means is configured to transmit said audiovisual data to said disk apparatus in accordance with said management information.

33. An audiovisual data processing apparatus in accordance with claim 32, further comprising:

data addition means for generating record data packets by adding predetermined data to said audiovisual data in accordance with said management information, and

said writing means for writing said data packets in said disk apparatus.

34. An audiovisual data processing apparatus comprising:

external disk interface means for controlling record/playback of audiovisual data for a disk apparatus,

external audiovisual apparatus interface means for controlling record/playback of said audiovisual data for an audiovisual apparatus,

a buffer memory for temporarily storing said audiovisual data, disposed between said external disk interface means and said audiovisual apparatus interface means,

buffer memory control means for controlling the input/output of said audiovisual data for said buffer memory,

playback data selection means for selecting said audiovisual data to be transmitted to said external audiovisual apparatus interface means from among said audiovisual data recorded in said disk apparatus,

reading means for reading said audiovisual data selected by said playback data selection means from said disk apparatus to said buffer memory via said external disk interface means, and

stream data generation means for generating stream data by combining the data stored in said buffer memory and for transmitting said stream data continuously to an external apparatus via said external audiovisual apparatus interface means.

35. An audiovisual data processing apparatus in accordance with claim 34,

wherein said playback data selection means selects said audiovisual data thinned out from said audiovisual data recorded on said disk medium in audiovisual frame units as data

to be output externally, and

said stream data generation means generates stream data by combining said audiovisual data in said buffer memory in audiovisual frame units at plural times.

36. An audiovisual data processing apparatus comprising:

external disk interface means for controlling record/playback of audiovisual data for an external disk apparatus,

external audiovisual apparatus interface means for controlling record/playback of said audiovisual data for an external audiovisual apparatus,

a buffer memory for temporarily storing said audiovisual data, disposed between said external disk interface means and said external audiovisual apparatus interface means,

buffer memory control means for controlling the input/output of said audiovisual data for said buffer memory,

playback data selection means for selecting said audiovisual data to be transmitted to said external audiovisual apparatus interface means from among said audiovisual data recorded in said disk apparatus,

reading means for reading said audiovisual data selected by said playback data selection means from said disk apparatus to said buffer memory via said external disk interface means,

data extraction means for extracting said audiovisual

data to be output externally from among said audiovisual data read from said disk apparatus, and

stream data generation means for combining and externally outputting said audiovisual data extracted by said data extraction means.

37. An audiovisual data processing apparatus comprising:

external disk interface means for controlling record/playback of audiovisual data for an external disk apparatus,

external audiovisual apparatus interface means for controlling record/playback of said audiovisual data for an external audiovisual apparatus,

a buffer memory for temporarily storing said audiovisual data, disposed between said external disk interface means and said external audiovisual apparatus interface means,

buffer memory control means for controlling the input/output of said audiovisual data for said buffer memory, and

audiovisual frame detection means for detecting audiovisual frame boundaries from said audiovisual data and for outputting a detection signal.

38. An audiovisual data processing apparatus in accordance with claim 37, further comprising:

transmitted/received data amount calculation means for calculating the amount of data input/output to said buffer

memory control means on the basis of the amount of audiovisual frame boundaries detected by said audiovisual frame detection means.

39. An audiovisual data processing apparatus in accordance with claim 37, further comprising:

a frame address management means for storing address values in said buffer memory corresponding to said audiovisual data at said audiovisual frame boundaries.

40. An audiovisual data processing apparatus in accordance with claim 37, further comprising:

frame address management means for storing address values in said buffer memory corresponding to said audiovisual data at said audiovisual boundaries, and

access address control means for controlling the access addresses of said buffer memory control means in accordance with the addresses of said frame address management means.

41. An audiovisual data processing apparatus in accordance with claim 37, further comprising:

data output timing control means for controlling the output timing of said audiovisual data in synchronization with the timing of detecting audiovisual frames by said audiovisual frame detection means.

42. An audiovisual data processing apparatus comprising:

external disk interface means for controlling

record/playback of audiovisual data for an external disk apparatus,

external audiovisual apparatus interface means for controlling record/playback of said audiovisual data for an external audiovisual apparatus, and

recording area management means for managing and updating, as the area information of the recorded audiovisual data recorded in said disk apparatus, the record start address information of the head audiovisual frame data of said recorded audiovisual data, the record start address information of the end audiovisual frame data of said recorded audiovisual data and the head address information of the unrecorded area in said disk apparatus, and for carrying out writing in predetermined areas in said disk apparatus.

43. An audiovisual data processing apparatus in accordance with claim 42, further comprising:

an address management means for managing the head address of the audiovisual frame data being recorded or played back or the head address of the audiovisual frame data to be recorded or played back next by said disk apparatus,

wherein said external disk interface means controls record/playback of audiovisual data in accordance with the sequence of the addresses in said disk apparatus.

44. An audiovisual data processing apparatus in accordance with claim 42, further comprising:

information detection means for detecting

discontinuous points at least in date/time data, time codes or absolute track numbers from among audiovisual data to be recorded on said disk apparatus, and

in the case that predetermined information is detected by said information detection means, mark information management means for managing and updating at least the record start address information corresponding to the audiovisual frame data from which said predetermined information is detected and the time code information or the absolute track number information included in said audiovisual frame data in said disk apparatus,

wherein said external disk interface means controls record/playback of audiovisual data in accordance with the sequence of the addresses in said disk apparatus.

45. An audiovisual data processing apparatus in accordance with claim 42, further comprising:

mark command receiving means for receiving a mark addition request from an external apparatus, and

mark information management means for managing and updating at least the record start address information in said disk apparatus corresponding to the audiovisual frame data being recorded or played back in said disk apparatus at the time of the generation of said mark addition request and the time code information or the absolute track number information included in said audiovisual frame data in response to said mark addition request from said external apparatus,

wherein said external disk interface means controls record/playback of audiovisual data in accordance with the sequence of the addresses in said disk apparatus.

46. An audiovisual data processing apparatus in accordance with claim 42, further comprising:

mark information receiving means for receiving mark information notified from an external apparatus, and

mark information management means for detecting the audiovisual frame data corresponding to the time code information or absolute track number information included in said mark information notified from said external apparatus at the time of recording audiovisual data in said disk apparatus, and for managing and updating the record start address information in said disk apparatus corresponding to said detected audiovisual frame data and the time code information or the absolute track number information included in said detected audiovisual frame data,

wherein said external disk interface means controls record/playback of audiovisual data in accordance with the sequence of the addresses in said disk apparatus.

47. An audiovisual control method comprising:

a step of temporarily storing audiovisual data in a buffer memory,

a step of detecting the audiovisual frame boundaries of said audiovisual data,

a step of dividing said audiovisual data in accordance

with said detected audiovisual frame boundaries, and of forming the management information of the divided audiovisual data, and

a step of transmitting said audiovisual data to a disk medium in accordance with said management information.

48. An audiovisual control method in accordance with claim 47, further comprising a step of generating record data packets by adding predetermined data to said divided audiovisual data.

49. An audiovisual control method comprising:

a step of reading selected audiovisual data from a disk medium,

a step of storing said read audiovisual data in a buffer memory, and

a step of generating stream data by combining said stored audiovisual data and externally outputting said stream data continuously.

50. An audiovisual control method in accordance with claim 49,

wherein said audiovisual data recorded on said disk medium is thinned out in audiovisual frame units at said reading step, and

said audiovisual data in said buffer memory is combined in audiovisual frame units at plural times and output at the step of externally outputting said stream data continuously.

51. An audiovisual control method comprising:

a step of selecting audiovisual data recorded on a disk medium,

a step of reading said selected audiovisual data from said disk medium,

a step of extracting audiovisual data to be output externally from said read audiovisual data,

a step of storing said extracted audiovisual data in a buffer memory,

a step of generating stream data by combining said above-mentioned stored audiovisual data, and

a step of externally outputting said generated stream data.

52. An audiovisual control method comprising:

a record/playback processing step of recording/playing back audiovisual data to be input from an external apparatus and said audiovisual data to be output to said external apparatus on said disk medium, and

recording area management step of managing and updating, as the area information of the recorded audiovisual data recorded in said disk apparatus, the record start address information of the head audiovisual frame data of said recorded audiovisual data, the record start address information of the end audiovisual frame data of said recorded audiovisual data and the head address information of the unrecorded area in said disk apparatus, and for carrying out writing in predetermined areas in said disk apparatus.

53. An audiovisual control method in accordance with claim 52, further comprising an address management step of managing the head address of said audiovisual frame data being recorded or played back on said disk medium or the head address of the audiovisual frame data to be recorded or played back next on said disk medium,

wherein record/playback is carried out in accordance with the sequence of the addresses on said disk medium at said record/playback processing step.

54. An audiovisual control method in accordance with claim 53, further comprising a playback control step of carrying out playback control of said audiovisual data on the basis of said area information or said head address information.

55. An audiovisual control method in accordance with claim 53, further comprising a record control step of carrying out record control of said audiovisual data on the basis of said area information or said head address information.

56. An audiovisual control method in accordance with claim 53, further comprising a search step of searching for audiovisual data recorded on said disk medium on the basis of an absolute track number or time code in response to a search request from an external apparatus.

57. An audiovisual control method in accordance with claim 52, further comprising

an information detection step of detecting discontinuous points at least in date/time data, time codes or

absolute track numbers from among audiovisual data to be recorded, and

in the case that predetermined information is detected by said information detection step, a mark information management step of managing and updating at least the record start address information corresponding to the audiovisual frame data from which said predetermined information is detected and the time code information or the absolute track number information included in said audiovisual frame data,

wherein record/playback is carried out in accordance with the sequence of the addresses on said disk medium at said record/playback processing step.

58. An audiovisual control method in accordance with claim 52, further comprising:

a mark command receiving step of receiving a mark addition request from an external apparatus, and

a mark information management step of managing and updating at least the record start address information corresponding to the audiovisual frame data being recorded or played back at the time of the generation of said mark addition request and the time code information or the absolute track number information included in said audiovisual frame data in response to said mark addition request from said external apparatus,

wherein record/playback is carried out in accordance with the sequence of the addresses on said disk medium at said

record/playback processing step.

59. An audiovisual control method in accordance with claim 52, further comprising:

a mark information receiving step of receiving mark information notified from an external apparatus, and

a mark information management step of detecting the audiovisual frame data corresponding to the time code information or absolute track number information included in said mark information notified from said external apparatus at the time of recording audiovisual data, and of managing and updating the record start address information on said disk medium corresponding to said detected audiovisual frame data and the time code information or the absolute track number information included in said detected audiovisual frame data,

wherein record/playback is carried out in accordance with the sequence of the addresses on said disk medium at said record/playback processing step.